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ABSTRACT

The effects of trait anxiety (stable anxiety resulting from personality characteristics pre-disposing an individual to anxiety) and test difficulty on state anxiety (transitory anxiety resulting from situations regarded as difficult or dangerous) and test difficulty perception of 25 undergraduates were studied. The Test Anxiety Inventory was used to assess trait anxiety, an Educational Psychology Recognition Test was used to assess test difficulty, a modified version of the State-Trait Anxiety Inventory was used to assess state anxiety, and the Test Perception Inventory was used to assess perception of test difficulty. The correlated t-test and analysis of variance design were used in analyzing the data. Results indicate that: (1) higher trait anxiety students experienced higher state anxiety than did their low anxiety peers, regardless of test difficulty; (2) perceptual differences of test difficulty for the trait anxiety groups were not significant for high or low difficulty tests; and (3) perceptual difference of test difficulty between the high and low difficulty tests were significant for the high and low trait anxiety groups, but not for the medium trait anxiety group. (Author/SLD)

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THE EFFECTS OF TRAIT ANXIETY ON STATE ANXIETY AND PERCEPTION OF TEST DIFFICULTY FOR UNDERGRADUATES ADMINISTERED HIGH AND LOW DIFFICULTY TESTS

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SUMMARY

This study investigated trait anxiety (stable anxiety resulting from personality characteristics predisposing an individual to anxiety) and test difficulty on state anxiety (transitory anxiety resulting from situations regarded as difficult or dangerous) and test difficulty perception of twenty-five undergraduates. The Test Anxiety Inventory assessed trait anxiety, an Educational Psychology Recognition Test assessed test difficulty, a modified version of the State-Trait Anxiety Inventory assessed state anxiety, and the Test Perception Inventory assessed perception of exam difficulty. The correlated t-test and analysis of variance design were used in analyzing the data. Results indicated: (1) higher trait anxiety students experienced higher state anxiety than did their low anxiety peers, regardless of test difficulty, $p<.05$, (2) perceptual differences of test difficulty for the trait anxiety groups were not significant for high or low difficulty tests, $p>.05$, and (3) perceptual difference of test difficulty between the high and low difficulty tests were significant for the high and low trait anxiety groups, $p<.05$, but not for the medium trait anxiety group, $p>.05$.

Introduction

Anxiety studies concerning undergraduates' academic experience were frequently reported in the literature (Head, 1981; Smith, 1971). Some researchers (Atkinson, 1964; Spielberger, 1972) have examined trait anxiety--i.e., stable anxiety resulting from personality characteristics which predispose an individual to anxiety (Sieber, 1977). Although state anxiety is usually low when a task is easy and is high when a task is difficult, Tobias (1977) indicated that difficulty level has been inadequately defined. Tests frequently were reported as being hard or easy on the basis of differences in their number of errors. Thus, that conclusion of Tobias (1977) that "until such results become available, significant progress in anxiety-treatment-interaction research is unlikely since a 'difficult' task in one study may be quite different from a 'difficult' task in another study," (p. 235) reveals the importance of empirically defining levels of test difficulty.

Head and Lindsey (1983) reported empirically established levels of task difficulty (median p values) that produced significant variations in state anxiety. Yet, these researchers (1984) reporting criterion test difficulty scores consistent with the difficulty levels of their previous study made the following reinterpretation. Even though test difficulty did not significantly affect state anxiety, *perceived* difficulty levels varying from the actual levels of test difficulty can probably explain state anxiety variations. Additional explanations

of the state anxiety finding also were that (1) the experimental context (i.e., students viewing a videotape for twenty-five minutes, then studying for twelve minutes and immediately taking an examination) possibly produced equivalent state anxiety levels and (2) if test difficulty has been investigated in conjunction with trait anxiety, significant state anxiety variations possibly could have occurred. The purpose of this study was not only to investigate the effects of empirically defined test difficulty levels (i.e., variations in median p values) in conjunction with trait anxiety, but also to determine if the finding on student perception of test difficulty (Head and Lindsey, 1984) would be replicated.

METHOD

Initially, subjects were twenty-five undergraduates in an educational psychology course; mean chronological age 24.2 (SD=1.3); mean American College Test Scores 18.8 (SD=3.0); mean grade point average 2.1 (SD=.12). They were assigned to one of three groups (high, medium, or low trait anxiety) in which a test of high difficulty was administered. Three days later, a test of low difficulty was administered to the same trait anxiety groups. The correlated t-test and ANOVA design were used in analyzing the data. Dependent variables were students' state anxiety scores and their perception of test difficulty scores.

State anxiety was assessed by a modified version of the State-Trait Anxiety Inventory (STAI) (A-State Scale) developed by O'Neil (1977). This instrument had five items (e.g., "I feel jittery," "I feel relaxed") and used the Likert scale for item responses ("not at all," "somewhat," "moderately so," and "very much so"). When the high and low difficulty tests were administered, the alpha reliabilities for the STAI were .93 and .84, respectively.

Student perception of test difficulty was assessed by the Test Perception Inventory (TPI) (Head, 1982). This instrument had twenty items (e.g., "I thought that this test was very easy," "This test was rather difficult") and employed a Likert format for item responses ("not at all," "somewhat so," "moderately so," and "extremely so"). When the high and low difficulty tests were administered, the alpha reliabilities for the TPI were .94 and .96, respectively.

The Test Anxiety Inventory (TAI) (Spielberger 1972) assessed trait anxiety. This instrument also had twenty items (e.g., "I feel confident and relaxed while taking tests") and employed a Likert scale for item responses ("almost never" to "almost always"). Reliability coefficients for the TAI reported in the literature have ranged from .80 to .95 (Head, 1981).

An Educational Psychology Recognition Test assessed task difficulty. Twenty-one multiple choice items measured the retention of information presented daily for one week via the traditional classroom lecture concerning the application of

research methodologies in education. Two forms of this test exhibited varying difficulty levels: Form A (high, 40% median p value, p value range 16% to 76%), and Form B (low, 91% median p value, p value range 65% to 100%).

Subjects were tested in three sessions in a university classroom. In the first they were given the TAI to obtain their trait anxiety grouping. In the second, subjects were administered the high difficulty test. After its completion, they were administered the STAI and TPI. In the third, subjects were administered the low difficulty tests. Following the completion of this easier form of the recognition test, they again were administered the STAI and TPI.

RESULTS

When the high difficulty test was administered, trait anxiety significantly affected state anxiety, $F(2,22)=16.06$, $p<.05$. Approximately fifty-nine percent of the variance (eta=.77) in the students' state anxiety scores were explained by their trait anxiety levels. Tukey's HSD Test (Ferguson, 1976) indicated (1) there were significant differences between the mean state anxiety scores for high and low state anxiety subjects (13.00 versus 6.29) and (2) high trait anxiety subjects did not have statistically higher state anxiety scores than medium trait anxiety subjects (15.29 versus 13.00).

When the low difficulty test was administered, trait anxiety also significantly affected state anxiety, $F(2, 20)=4.60$, $p<.05$. Approximately thirty-one percent of the variance (eta=.56)

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in the undergraduates' state anxiety scores were explained by their trait anxiety levels. Tukey's HSD Test (Ferguson, 1976) indicated (1) there were significant differences between the mean state anxiety scores for high and low trait anxiety subjects (10.17 versus 6.28) and (2) there was no significant difference between the mean state anxiety scores for high and medium trait anxiety subjects (10.17 versus 10.4).

Additionally, no significant variations between the mean test perception scores for the trait anxiety groups taking either the high difficulty, $F(2, 22)=30$, or low difficulty test, $F(2, 20)=.74$, were found, $p>.05$. However, there were significant differences between the mean test perception scores of the high and low difficulty tests for the high, $t(5)=2.52$, $p<.05$, and low, $t(5)=2.5$, $p<.05$, trait anxiety groups, respectively. The mean test perception score of the high difficulty test for the high trait anxiety group was statistically higher than their mean test perception score for the low difficulty test (67.38 versus 51.67).

In addition, the mean test perception score of the high difficulty test for the low trait anxiety group was statistically higher than their mean test perception score for the low difficulty test (64.86 versus 49.28). The medium trait anxiety mean test perception score of the high difficulty test was not significantly higher than their mean test perception score for the low difficulty test, $t(8)=1.65$, $p>.05$.

DISCUSSION

Several conclusions could be considered appropriate. First, criterion test difficulty scores (high, 40 median p value, p value range 16% to 76% and low, 91% median p value, p value range 65% to 100%) were altered in respect to the difficulty levels previously reported by Head and Lindsey (1983, 1984). Probably the presentation and testing of information over an extended time interval decreased the difficulty of the tests in the current study. Second, the following criterion scores on the TAI for identifying anxiety proneness were revealed: low, 20 to 25; medium, 27 to 40; and high, 43 to 80. Third, undergraduates exhibiting higher trait anxiety ~~(i.e., high and medium)~~ experienced statistically higher state anxiety than low trait anxiety, regardless of test difficulty level. Possibly significant variations in state anxiety were more detectable when investigated in conjunction with trait anxiety and/or a setting more familiar to undergraduates. Fourth, since the perception of test difficulty for undergraduates exhibiting low trait anxiety was essentially the same as the higher trait anxiety students (i.e., high and medium) for both the high and low difficulty tests, variations in the perception of test difficulty among the trait anxiety groups cannot be used to explain the state anxiety findings. Fifth, the finding of a statistically higher mean test perception score for both the high and low trait anxiety groups supports the finding of Head and Lindsey (1984) that student perception of test

difficulty corresponded closely with the actual difficulty levels. Sixth, since the medium trait anxiety mean test perception score of the high difficulty test was not significantly higher than their mean test perception score for the low difficulty test, total support of the aforesaid conclusion was not provided.

Thus, a comprehensive summary of the data strongly supports the interpretations that higher trait anxiety students experience higher state anxiety than did their low trait anxiety peers regardless of test difficulty, that perceptual differences of test difficulty among the trait anxiety groups could not be used as an appropriate explanation of the state anxiety variations, and that students' perception of test difficulty is frequently consistent with actual difficulty level.

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